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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,694	10/03/2003	Robert S. Afzal	902.0129.U1(US)	9957
29683	7590	07/29/2004	EXAMINER	
HARRINGTON & SMITH, LLP 4 RESEARCH DRIVE SHELTON, CT 06484-6212			MENEFE, JAMES A	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/678,694

Applicant(s)

AFZAL ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/3/2003</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4, 9-12, 25-27, and 30-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Peterson et al. (US 6,377,593).

Regarding claim 1, Peterson discloses a monolithic side pumped passively Q-switched laser comprising a laser resonator composite structure comprised of a laser gain medium 12 optically contacting a passive Q-switch 14, wherein the composite structure comprises end faces 16 forming a linear optical path resonant cavity therebetween and comprising at least partially reflecting coatings 18,20, the gain medium 12 comprising side face 24 for receiving pump light. See Fig. 1.

Regarding claim 2, pump source 22 may be a laser diode array (col. 6 lines 65-66).

Regarding claim 4, the reflective coatings may be external to the resonant cavity as in Fig. 2.

Regarding claim 9, the gain medium comprises the claimed materials (col. 5 lines 40-43).

Regarding claim 10, the Q-switch comprises Cr:YAG (col. 5 lines 50-51).

Regarding claims 11-12, 25-27, and 30-33, the limitations of the claims are all disclosed by Peterson, except there is not explicitly disclosed the means for thermal aberration

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compensation. However, Peterson includes a tilt as claimed. It is inherent that this tilt will provide the functional limitations of providing temperature aberration, since the claimed structure is identical to the prior art structure, i.e. a tilted end.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 5-8, 14-24, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson. Peterson discloses the limitations of the claims above, but does not disclose the following:

Regarding claim 3, Peterson does not disclose the flashlamp pump. It is common in the art to pump a laser with a flashlamp. It would have been obvious to one skilled in the art to use a flashlamp as the pump by way of obvious engineering design choice.

Regarding claims 5-8, there are not disclosed the internal or external cavity non-linear crystals as claimed. It is extremely well known to include a frequency doubler internal or external to a laser cavity. It would have been obvious to one skilled in the art to include a frequency doubler so that a user can obtain laser light of shorter wavelengths than those produced by typical gain media, as is known.

Regarding claim 14, Peterson discloses a method of fabricating a monolithic side pumped Q-switch laser comprising placing a saturable absorber layer in optical contact with a gain

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material to form a composite structure, cutting the composite structure into a plurality of substructures comprising a length of the gain material optically contacting the saturable absorbing material, and blocking up a plurality of the sub-structures and forming an AR coating on the side of the substructures. See Figs. 4-6 and discussion. Polishing is not explicitly described. However, it is known to polish a surface prior to applying a coating. It would have been obvious to one skilled in the art at the time of the invention to polish the surface prior to deposition as this increases the adhesion strength between the surface and the coating, as is well known.

Regarding claim 15, the pump is coupled to the pump receiving side of the composite structure.

Regarding claim 16, for the same reasons above, it would have been obvious to polish the sides prior to depositing the reflectors described in Peterson.

Regarding claim 17, an AR coating is provided in Peterson.

Regarding claim 18, Peterson described the depositing of the AR coating as being done in a variety of manners. The claimed methods of deposition are well known in the art, and thus would have been contemplated by one skilled in the art when reading Peterson.

Regarding claim 19, the AR coating is a multilayered interference stack.

Regarding claims 20-23, these methods are disclosed by Peterson. See col. 10.

Regarding claim 24, Peterson includes the tilt. See the 102 rejection above.

Regarding claim 28, the particular tilt angle is not disclosed. However, the amount of tilt will affect the amount of temperature compensation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the particular amount of tilt,

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since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 13 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson in view of Sumida et al. (US 5,847,871). The limitations of the claims are all disclosed by Peterson, except there is not disclosed the Porro prism. Sumida teaches a laser system incorporating a Porro prism. It would have been obvious to one skilled in the art to include the Porro prism for optimal efficiency of lasing, as taught by Sumida.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JM  
July 23, 2004



MINSUN OH HARVEY  
PRIMARY EXAMINER